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NOMENCLATURAL PROPOSALS IN *ATRIPLEX* (CHENOPODIACEAE)

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ABSTRACT. This article includes a report of nomenclatural novelties in the genus *Atriplex*, which were determined as appropriate following preparation of a summary revision of the genus for the Flora of North America Project. Subgeneric novelties include: *Atriplex* subgen. *Obione, stat. nov.* and *Atriplex* subgen. *Pterochiton, stat. nov.* Sectional or subsectional taxa are: *Atriplex* subgen. *Obione* sect. *Pleianthae, sect. nov.*; *Atriplex* sect. *Obione* subsect. *Graciliflorae, stat. nov.*; *Atriplex* sect. *Obione* subsect. *Saccariae, stat. nov.*; *Atriplex* sect. *Obione* subsect. *Argenteae,* stat. nov.; *Atriplex* sect. *Obione* subsect. *Truncatae, comb. nov.*; *Atriplex* sect. *Obione* subsect. *Wolfianae, comb. nov.*; *Atriplex* sect. *Obione* subsect. *Pusillae, comb. nov.*; *Atriplex* sect. *Obione* subsect. *Arenariae, comb. nov.*; *Atriplex* sect. *Obione* subsect. *Leucophyllae, comb. nov.*; *Atriplex* sect. *Obione* subsect. *Californicae, comb. nov.*; *Atriplex* sect. *Phyllostegiae, comb. nov.*; and *Atriplex* sect. *Covilleiae, sect. nov.* New varietal combinations are: *Atriplex gmelinii* var. *alaskensis, comb. nov.*; *A. glabriuscula* var. *acadiensis, comb. nov.*; *A. glabriuscula* var. *franktonii, comb. nov.*; *A. saccaria* var. *cornuta, comb. nov.*; *A. saccaria* var. *asterocarpa, comb. nov.*; *A. argentea* var. *longitrichoma, comb. nov.*; *A. argentea* var. *rydbergii, comb. nov.*; *A. powellii* var. *minuticarpa, comb. nov.*; *A. wolfii* var. *tenuissima, comb. nov.*; *A. parishii* var. *minuscula, comb. nov.*; *A. parishii* var. *depressa, comb. nov.*; *A. parishii* var. *subtilis, comb. nov.*; *A. parishii* var. *persistens, comb. nov.*; *A. cordulata* var. *erecticaulis, comb. nov.*; and *A. coronata* var. *vallicola, comb. nov.*

Key Words: *Atriplex*, nomenclature

The proposals presented herein are preliminary to publication of a summary revision of the genus *Atriplex* L. for North America. The main body of the article will be published as a part of the Flora of North America Project, and is to be presented in prepublication form, possibly through the internet system. Thus it is deemed necessary to present the proposals to the scientific community in standard form prior to that event.

Interpretations of the genus and its included taxa in North America have undergone modifications since the first attempts at revision of the genus by Sereno Watson (1874) and by Paul C. Standley (1916). The work of Hall and Clements (1923) pre-

sented a then revolutionary treatment in which species were enlarged to include complexes of related taxa under a trinomial or quadrinomial system. Since 1923 most workers chose to follow the work of Hall and Clements in provincial treatments, but as more information became available the large groupings of Hall and Clements were dissected again (Bassett et al. 1983; Taschereau 1972). Other papers have dealt with portions of the genus or have added new taxa (Stutz and Chu 1993a, 1993b, 1997a, 1997b; Stutz et al. 1975, 1990, 1993, 1994, 1997, 1998; Stutz and Sanderson 1983, 1998).

The present author (Welsh 1993, 1995, unpubl. ms.) has attempted to strike a balance between the complex, and often unnatural, groupings as interpreted by Hall and Clements, and the more natural arrangement of individualized taxa of the later authors. He has also attempted to examine all original descriptions (see included list of references) and the type specimens of all names involved in the genus in North America. Still, when taxa were apparently closely allied and of the same general morphological conformation, they have been united in the present work as varieties under an inclusive species. This is the case with most of the nomenclatural novelties given below.

Many of the names treated herein were formally proposed by Standley (1916), but with the taxonomic rank not designated. They serve as basionyms for many of the infrageneric proposals presented in this paper.

Atriplex gmelinii C. A. Mey. ex Bong., Mem. Acad. St. Petersb. VI. 2: 160 (Observ. Veg. Sitcha 41). 1838.

var. **alaskensis** (S. Watson) S. L. Welsh, *comb. nov.*, based on: *Atriplex alaskensis* S. Watson, Proc. Amer. Acad. Arts 9: 108. 1874.

Bassett et al. (1983) distinguish var. *alaskensis* at the rank of species from the closely allied *Atriplex gmelinii* by the sizes of brown seeds (i.e., 1.7–2.7 mm wide in *A. gmelinii* and 2.8–3.7 mm wide in *A. alaskensis*). However, some seeds of *A. gmelinii* measure as much as 3 mm wide, so the distinction in seed size is not absolute. Also, *A. gmelinii* occasionally bears black shiny seeds, which have not been observed in specimens of var. *alaskensis*. It appears that mainly juvenile plants have been collected, those which lack mature fruiting bracteoles and seeds. The *alaskensis* phase occurs completely within the range of *A. gmelinii*,

and it might represent no more than a growth phase of the latter species. Certainly there is considerable ecologically induced variation within the *gmelinii* complex. Plants that grow within the littoral, where they are inundated by high tide, show a completely different series of facies than do those that are immediately above the tidal zone. Leaves vary from linear to oblong, oval, and various other shapes within what has been traditionally regarded as *A. gmelinii* in a strict sense (*A. patula* var. *obtusa, sensu* various authors). The two entities, *gmelinii* and *alaskensis* are treated herein as belonging to an inclusive *A. gmelinii.*

Atriplex glabriuscula Edmondston, Fl. Shetland 39. 1845.

var. **acadiensis** (Tascher.) S. L. Welsh, *comb. nov.*, based on: *Atriplex acadiensis* Tascher., Canad. J. Bot. 50: 1577–1579. 1972.

Historically, this taxon has been thought to be closely allied to the ruderal weed, *Atriplex patula* L. (with which it is often sympatric, and with which it was synonymized by Gleason and Cronquist 1991:101), but from which it differs in some aspects (shorter, stockier, rarely over 4 dm tall; bracteoles ovate-triangular and joined only at the base, not rhombic-triangular with margins united almost to the middle). The variety, like *A. glabriuscula, sensu lato*, appears to be confined mainly to native habitats in saline marshes, and apparently is not, or is seldom, a ruderal weed as is the case with *A. patula.* It grows occasionally with the indigenous *A. dioica* Raf., which has elliptic (not round) seeds.

Plants examined from New Brunswick typically have at least half of the nodes opposite, and with opposite branches of unequal size. The plants still seem to be closely allied to, and perhaps not always separable from the largely sympatric *Atriplex glabriuscula.* Bassett et al. (1983: 12) indicate that *A. acadiensis* formed spontaneous hybrids with *A. glabriuscula* in the Botanic Garden at Manchester England, noting further that these "presumably sterile triploid hybrids exhibited marked heterosis."

var. **franktonii** (Tascher.) S. L. Welsh, *comb. nov.*, based on: *Atriplex franktonii* Tascher., Canad. J. Bot. 50: 1586–1589. 1972.

This taxon has been placed in synonymy of *Atriplex hastata* L. (i.e., *A. prostrata* Boucher ex DC.) by Gleason and Cronquist (1991: 102), but is clearly more nearly allied to *A. glabriuscula* within whose range it is completely submersed. It is likewise evidently confined to indigenous salt marsh habitats, unlike the

clearly ruderal weedy status of the evidently introduced *A. prostrata*.

Atriplex subgen. *Obione* (Gaertn.) S. L. Welsh, *stat. nov.*, based on: *Obione* Gaertn., Fruct. II. 198. t. 126. 1791; subgen. *Obione* [autonym created by subgen. *Pterochiton* (Torr. & Frem.) Ulbr., *in* Engl. & Prantl, Nat. Pflanzenfam, ed. 2. 16c: 509. 1934]; sect. *Obione* (Gaertn.) Rchb., Consp. Regn. Veg. 164. 1828; C. A. Mey. *in* Ledeb., Fl. Altaic. 4: 315. 1833.

Plants monoecious to subdioecious or less commonly dioecious annuals or perennials, the leaves (typically) with or (uncommonly) without Kranz anatomy. Staminate flowers with calyx lobes crested or not. Pistillate flowers bibracteolate, lacking or rarely with a perianth (in *Atriplex covillei*, *A. pleiantha*, and *A. suckleyi*). Bracteoles cuneate to ovate or obovate united at least to the middle; the faces with tubercles or crests or smooth; the seeds erect; the radicle typically superior (except in *A. pleiantha*), erect, the tip adjacent to styles.

TYPE species: *Atriplex muriculata* Gaertn. (*nom. illeg.*) = *A. sibirica* L.

The subgenus is comprised of numerous, indigenous North American species and some Old World ones as well.

Atriplex subgen. *Obione* sect. *Pleianthae* S. L. Welsh, *sect. nov.* TYPE: *Atriplex pleiantha* W. Weber, Madroño 10: 189. 1950; *Proatriplex* (W. Weber) Stutz & G. L. Chu, Amer. J. Bot. 77: 366. 1990; *Atriplex* subgenus *Proatriplex* W. Weber, Madroño 10: 188. 1950.

Similis subgeno *Obione* secti *Endolepe* Torr. sed in bracteolis multifloribus habentibus, sepalis staminata noncristatis et radicula inferiore absimilis.

Plants monoecious annuals, the leaves with normal (non-Kranz) anatomy. Staminate flowers with calyx lobes not crested. Pistillate flowers bibracteolate, enclosing 2–5 flowers, these typically with a 5-lobed perianth. Bracteoles triangular-ovate united to the middle or above, the faces lacking tubercles, the seeds erect, the radicle lateral, declined (the tip at opposite end from the styles).

TYPE species: *Atriplex pleiantha* W. Weber.

The section is monotypic, with distribution as noted below. The relationship of the solitary included taxon, *Atriplex pleiantha*,

with other species of *Atriplex* in the Colorado Plateau is illusory. Great weight has been given to the presence of apparently primitive inflorescences within the flowering bracteoles, but that feature is probably derived, and not primitive. The linear, pale, perianth segments subtending the 3–5 flowers are not unlike those within both *A. phyllostegia* and *A. suckleyi,* both of which also lack Kranz anatomy in their leaves, but from which they are otherwise grossly dissimilar. Rather than representing primitive features, the presence of the perianth and in the case of *A. pleiantha,* multiple flowers, these striking and seductively attractive features appear to represent independent, derived occurrences within the highly variable genus *Atriplex.* If any of them are to be segregated within separate genera, then each should be so treated. The radicle placement in seeds of section *Pleianthae* is inferior (with the tip of the radicle at a point diametrically opposed to the styles), possibly pointing to a relationship divergent from the other species with perianth scales subtending the ovary in pistillate flowers. Because of the radicle position, the section might well have been placed within subgenus *Atriplex.* However, the radicle position might also be a derived condition, at least in some cases. If so, the relationship could well lie with other members currently treated within the subgenus *Obione.* It is anomalous wherever it is placed.

Atriplex sect. *Obione* subsect. *Graciliflorae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* VI. *Graciliflorae* Standl., N. Amer. Fl. 21: 34, 45. 1916.

Leaves short-petiolate, the blades often subcordate, entire. Staminate flowers in paniculate glomerules, the panicles soon deciduous. Fruiting bracteoles pedicellate, suborbicular (samara-like), united, entire or nearly so, the faces lacking tubercles.

TYPE species: *Atriplex graciliflora* M. E. Jones, Proc. Calif. Acad. Sci. II. 5: 717. 1895.

The subsection is monotypic, with the solitary species endemic to saline clays and silts of southeastern Utah.

Atriplex sect. *Obione* subsect. *Saccariae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* VII. *Saccariae* Standl., N. Amer. Fl. 21: 34, 45. 1916.

The leaves short-petiolate; the blades mostly cordate or ovate, entire. Staminate flowers in spicate or paniculate glomerules; the

inflorescence soon deciduous. Fruiting bracteoles typically (but not always) dimorphic; some large, pedicellate and the faces mostly tuberculate, the others small, cuneate and unappendaged, or lacking.

TYPE species: *Atriplex saccaria* S. Watson, Proc. Amer. Acad. Arts 9: 112. 1874.

The subsection consists of a single species with three varieties, all distributed from Wyoming and Utah south to Arizona, New Mexico, and Texas.

Members of the subsection *Saccariae* are closely allied with, and morphologically similar to, members of subsection *Argenteae,* and differing in the usually dimorphic fruiting bracteoles, with the smaller sessile bracteoles mainly lacking surficial appendages, but with radiating appendages on the larger stipitate bracteoles, or where the mainly stipitate bracteoles are monomorphic, by the appendages radiating from the globular surface. The alliance of this complex with the *argentea* assemblage is suggested by intermediacy of even the main diagnostic features. It seems probable that the sessile, smooth-faced bracteole might have been derived from some *argentea* type ancestor. Certainly the two complexes are closely allied both taxonomically and geographically.

Atriplex saccaria S. Watson, Proc. Amer. Acad. 9: 112. 1874.

var. **cornuta** (M. E. Jones) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex cornuta* M. E. Jones, Proc. Calif. Acad. Sci. II. 5: 718. 1895.

var. **asterocarpa** (Stutz, G. L. Chu & S. C. Sand.) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex asterocarpa* Stutz, G. L. Chu & S. C. Sand., Madroño 41: 199. 1994.

The species consists of three infraspecific taxa. It is, in a broad sense, a taxon with great variability, and is confined to the American West from Wyoming south to the Four-Corners portion of Colorado, New Mexico, Arizona, and Utah.

Atriplex sect. *Obione* subsect. *Argenteae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* VIII. *Argenteae* Standl., N. Amer. Fl. 21: 34, 46. 1916. Synonym: *Atriplex* IX. *Powellianae* Standl., N. Amer. Fl. 21: 34, 46. 1916.

Leaves petiolate or sessile, alternate or the lowermost opposite, the blades typically broadest near the base, entire or dentate, often

hastate. Staminate flowers in axillary glomerules, or the glomerules paniculate. Fruiting bracteoles monomorphic, sessile or pedicellate, usually broadest at or above the middle, the faces tuberculate or smooth.

TYPE (LECTOTYPE: vide McNeill et al., Agric. Canada Monogr. 31: 17. 1983) species: *Atriplex argentea* Nutt., Gen. N. Amer. Pl. 1: 198. 1818.

The subsection consists of three (more or less) polymorphic species, some of which are further subdivided into varieties, distributed from British Columbia east to Manitoba and south to California, Arizona, New Mexico, and Texas.

Atriplex argentea Nutt., Gen. N. Amer. Pl. 1: 198. 1818.

var. **longitrichoma** (Stutz, G. L. Chu & S. C. Sand.) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex longitrichoma* Stutz, G. L. Chu & S. C. Sand., Madroño 45: 128. 1998.

var. **rydbergii** (Standl.) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex rydbergii* Standl., N. Amer. Fl. 21: 47. 1916. Synonym: *A. pachypoda* Stutz & G. L. Chu, Madroño 44: 277. 1997.

The species is widely distributed over much of the American West and exhibits a great variety of morphological subunits, some of which are geographically correlated. The two combinations proposed herein represent taxa with such correlations.

Atriplex powellii S. Watson, Proc. Amer. Acad. Arts 9: 114. 1874.

var. *minuticarpa* (Stutz & G. L. Chu) S. L. Welsh, *stat. nov.*, based on: *Atriplex minuticarpa* Stutz & G. L. Chu, Madroño 40: 161. 1993.

This taxon, which occurs entirely within the geographical area of the species proper, is a local endemic on fine-textured saline substrates in eastern Utah.

Atriplex sect. *Obione* subsect. *Truncatae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* X. *Truncatae* Standl., N. Amer. Fl. 21: 34, 49. 1916.

Leaves petiolate or the uppermost sessile, alternate, the blades typically broadest near the base, entire or nearly so. Staminate flowers in axillary glomerules. Fruiting bracteoles monomorphic, sessile or short-pedicellate, broadly cuneate, dentate at the truncate apex, the faces typically smooth.

TYPE (LECTOTYPE: vide McNeill et al., Agric. Canada Monogr. 31: 17. 1983) species: *Obione truncata* Torr. *ex* S. Watson = *Atriplex truncata* (Torr. *ex* S. Watson) A. Gray, Proc. Amer. Acad. Arts 8: 398. 1872.

The subsection is monotypic, with distribution rather broad in the American West.

Atriplex sect. *Obione* subsect. *Wolfianae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* XI. *Wolfianae* Standl., N. Amer. Fl. 21: 34, 49. 1916.

Leaves sessile, alternate, the blades linear, entire. Staminate flowers in axillary glomerules. Fruiting bracteoles monomorphic, sessile or subsessile, cuneate, entire, the faces typically short-tuberculate.

TYPE species: *Atriplex wolfii* S. Watson, Proc. Amer. Acad. Arts 9: 112. 1874.

The subsection is monotypic, the solitary species with two geographical races separated herein as varieties; their distributions include southern Wyoming, Colorado, and Utah.

Atriplex wolfii S. Watson, Proc. Amer. Acad. Arts 9: 112. 1874.

var. **tenuissima** (A. Nelson) S. L. Welsh, *comb.* et *stat. nov.*, based on: *A. tenuissima* A. Nelson, Bot. Gaz. 34: 359. 1902.

This variety is known from southwest Wyoming, north-central and western Colorado, and central to northeastern Utah.

Atriplex sect. *Obione* subsect. *Pusillae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* XII. *Pusillae* Standl., N. Amer. Fl. 21: 50. 1916.

Sometimes villous as well as scurfy; the leaves opposite or alternate, sessile, small, ovate to linear, entire. Staminate flowers in axillary glomerules. Fruiting bracteoles monomorphic, sessile or subsessile, typically ovate or hastate, broadest at or near the base, entire or denticulate, the faces tuberculate or smooth.

TYPE species: *Obione pusilla* Torr. = *Atriplex pusilla* (Torr.) S. Watson, Proc. Amer. Acad. Arts 9: 110. 1874.

The subsection is comprised of five species, some of them with two or more constituent varieties. In large part, they are distributed in the Great Valley of California, with extensions to the coastal region of southern California and to western Nevada and

southeastern Oregon. The members of the subsection are characterized by its small leaves and tiny fruiting bracteoles.

Atriplex parishii S. Watson, Proc. Amer. Acad. Arts 17: 377. 1882.

var. **minuscula** (Standl.) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex minuscula* Standl., Fl. N. Amer. 21: 51. 1916.

var. **depressa** (Jeps.) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex depressa* Jeps., Pittonia 2: 304. 1892.

var. **subtilis** (Stutz & G. L. Chu) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex subtilis* Stutz & G. L. Chu, Madroño 44: 184. 1997.

var. **persistens** (Stutz & G. L. Chu) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex persistens* Stutz & G. L. Chu, Madroño 40: 211. 1993.

The *parishii* complex consists of a series of subordinate, small-leaved taxa with distribution mainly in the Great Valley of California. They differ from other in subtle but evidently consistent ways.

Atriplex cordulata Jeps., Pittonia 2: 304. 1892.

var. **erecticaulis** (Stutz, G. L. Chu & S. C. Sand.) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex erecticaulis* Stutz, G. L. Chu & S. C. Sand., Madroño 44: 89. 1997.

This is yet another of the minor variants of species in the Central Valley of California.

Atriplex coronata S. Watson, Proc. Amer. Acad. Arts 9: 114. 1874.

var. **vallicola** (Hoover) S. L. Welsh, *comb.* et *stat. nov.*, based on: *Atriplex vallicola* Hoover, Leafl. W. Bot. 2: 130. 1938.

This is another variant of a species with distribution in the Great Central Valley of California.

Atriplex sect. *Obione* subsect. *Arenariae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* XIV. *Arenariae* Standl., N. Amer. Fl. 21: 34, 52. 1916.

Erect or decumbent-ascending, monoecious annuals or perennials. Leaves with Kranz type anatomy, alternate, short-petiolate or sessile, the blades typically widest at or above the middle, entire or dentate. Staminate flowers in axillary glomerules or

these in paniculate spikes. Fruiting bracteoles monomorphic, sessile or subsessile, broadest near or above the base, dentate, the faces smooth or tuberculate.

TYPE species: *Atriplex arenaria* Nutt. = *A. mucronata* Raf., Amer. Monthly Mag. & Crit. Rev. 2: 119. 1817.

The subsection is comprised of more than a dozen species, eight of which occur in or near coastal regions from the eastern U.S. to the south and west along the Gulf coast, and along the coast of California.

Atriplex sect. *Obione* subsect. *Leucophyllae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* XVI. *Leucophyllae* Standl., N. Amer. Fl. 21: 34, 58. 1916.

Erect or prostrate, monoecious perennials. Leaves with Kranz anatomy, alternate, sessile, the blades typically widest at or near the middle, entire. Staminate flowers in axillary glomerules or these in short spikes. Fruiting bracteoles monomorphic, sessile, rotund-ovate and spongy-thickened, entire or dentate, the faces tuberculate.

TYPE species: *Obione leucophylla* Moq. = *Atriplex leucophylla* (Moq.) D. Dietr., Syn. Pl. 5: 536. 1852.

The subsection is monotypic, with distribution in coastal California and Baja.

Atriplex sect. *Obione* subsect. *Californicae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* V. *Californicae* Standl., N. Amer. Fl. 21: 34, 44. 1916.

Prostrate, monoecious or dioecious perennials. Leaves typically with Kranz anatomy, alternate or opposite, sessile, the blades widest from below to above the middle, entire. Staminate flowers in axillary glomerules. Fruiting bracteoles monomorphic, sessile or short-stipitate, ovate, entire or dentate, the faces unappendaged.

TYPE species: *Atriplex californica* Moq., Prodr. 13(2): 98. 1849.

The subsection is comprised of three disparate but subtly comparable species, two of them from along the sea beaches and cliffs of the California coast, the other from southwestern Texas and adjacent Mexico.

Atriplex subgen *Obione* sect. *Phyllostegiae* (Standl.) S. L. Welsh, *stat. nov.*, based on: *Atriplex* XXVII. *Phyllostegiae* Standl., N. Amer. Fl. 16: 34, 69. 1916.

Plants monoecious or subdioecious glabrate annuals. Leaves with Kranz anatomy, alternate, petiolate, the blades variously rhombic-triangular, oval or lanceolate, entire or subhastate. Staminate flowers in axillary glomerules or in naked terminal spikes. Fruiting bracteoles sessile or stipitate, sharply hastate and often sharply cristate as well, united to above the middle, the enclosed pistillate flower lacking a perianth.

TYPE species: *Obione phyllostegia* Torr. *ex* S. Watson = *Atriplex phyllostegia* (Torr. *ex* S. Watson) S. Watson, Proc. Amer. Acad. Arts 9: 108. 1874.

Atriplex subgen. *Obione* sect. *Covilleiae* S. L. Welsh, *sect. nov.*

Folliis alternis sessilibus vel subsessilibus floribus staminatis axillaribus vel in racemes terminales bracteolis omnibus similis.

Plants monoecious or subdioecious glabrate annuals. Leaves without typical Kranz anatomy, alternate, petiolate, the blades sharply triangular-hastate or less commonly some of them entire, the overall shape ovate to lanceolate or elliptic. Staminate flowers in axillary glomerules or in naked terminal spikes. Fruiting bracteoles sessile or stipitate, mostly 3-lobed, the lateral lobes rounded, united only at the base, the enclosed pistillate flower with a calyx of 3 (1–5) segments.

TYPE species: *Endolepis covillei* Standl. = *Atriplex covillei* (Standl.) J. F. Macbr., Contr. Gray Herb. II. 53: 11. 1918.

The section is monotypic, with distribution in southeastern Oregon, western Nevada, and California.

The pattern of venation is very similar to that of the closely comparable *Atriplex phyllostegia*, even though the veins lack the associated C-4 arrangement of chloroplast bearing cells in contact with the veins. The plants differ otherwise as noted in the descriptions. Placement of this species within the segregate genus *Endolepis* by various workers is based on two morphological characteristics considered to be of fundamental importance (i.e., the lack of Kranz leaf anatomy and the presence of sepals subtending the ovary within the fruiting bracteoles). However, sepals of staminate flowers in *A. covillei* lack the distinctive crests present in *A. [Endolepis] suckleyi*, a feature on which the genus *Endelopis* was based. The placement of *A. covillei* within *Endolepis*, while convenient, does not take into account the overall similarity of this species to the evidently related *A. phyllostegia*.

Neither does it take into account the potential for recurrence of sepals subtending the ovaries as possibly derived features.

Atriplex subgen. *Pterochiton* (Torr. & Frem.) S. L. Welsh, *stat. nov.*, based on: *Pterochiton* Torr. & Frem., *in* Frem., Rep. Exped. Rocky Mts. 318. 1845. [*Obione* subgen. *Pterochiton* (Torr. & Frem.) Ulbr. *in* Engl. & Prantl, Nat. Pflanzenfam, ed. 2 16c: 509. 1934; *Obione* sect. *Deserticola* Ulbr. *in* Engl. & Prantl, Nat. Pflanzenfam, ed. 2 16c: 508. 1934; *Atriplex* sect. *Deserticola* (Ulbr.) McNeill, Bassett, Crompton & Tascher., Agric. Canada Monogr. 31: 17. 1983; *Atriplex* XXVI. *Nuttallianae* Standl., N. Amer. Fl. 21: 66. 1916; *Atriplex* XXVIII. *Confertifoliae* Standl., N. Amer Fl. 21: 70. 1916; *Atriplex* XXIX. *Canescentes* Standl., N. Amer. Fl. 21: 70. 1916.]

The subgenus consists of dioecious or subdioecious shrubs of western American distribution. The leaves possess Kranz anatomy, and the radical position is typically superior. That they are closely allied is indicated by the propensity of all or most of the included taxa forming hybrids when they are in geographical contact.

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